

**Appl. No.** : **10/595,804**  
**Filed** : **June 12, 2006**

**AMENDMENTS TO THE DRAWINGS**

Applicants request to designate Fig. 4 as "Background Art" since it shows a conventional belt as explained at page 12, lines 9-15, for example. No new matter has been added. Approval of this amendment is respectfully requested. A "Replacement Sheet" for each sheet of drawings being amended can be found in the Appendix.

**REMARKS**

**Request for Entry of Amendments**

Claim 1 has been canceled as being directed to a non-elected invention. Claims 2 and 10 have been amended to include the features of Claim 13, and Claim 13 has been canceled. No new issue has been raised with regard to Claims 2 and 10 because the scope of amended Claim 10 is substantially unchanged relative to previously pending and now canceled Claim 13, and amended Claim 2 is similar in scope to Claim 10. Fig. 4 has been amended to indicate "Background Art" as it shows a conventional belt as described at page 12, lines 9-15, for example. No new matter has been added. Applicant respectfully requests entry of the amendments and reconsideration of the application in view of the amendments and the following remarks.

**Rejections of Claims 2-3, 5, 7, 10-13 Under 35 U.S.C. § 103**

Claims 2-3, 5, 7, 10-13 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Kimura (JP 10-184808) in view of Ueda et al ("Noise and Life of Helical Timing Belt Drives") and further in view of Onoe et al (US 4,790,802).

**1. Fig. 4 Shows Conventional Belt**

The Examiner asserts: "(Fig. 1, the belt as disclosed by Kimura has substantially the same structure as that disclosed by the applicant, see Fig. 4 of the instant application, therefore as irregularities are created by the cord twist and as the examiner understands, the cords proximity to the tooth gap surface, the belt of Kimura, while not disclosing irregularities would inherently have such irregularities as the structure is substantially the same, further irregularities and imperfections will exist in every instance, no matter what the physical structure)" *Office Action* p. 3. Applicants respectfully disagree.

The instant specification discusses Kimura as follows:

Fig. 4 shows another example of belt structure, where canvas (9) is attached on the belt surface on the tooth side.

The belt described in Patent Literature 2 [*Kimura*] as cited in the explanation of conventional belts is of this type. When canvas is attached, however, the canvas contacts the pulley and therefore the belt is affected by the friction between the pulley and canvas. The belt is also affected by the weaving of the canvas. Therefore, *this type of structure is not suitable for applying the present invention.*

*Specification* at page 6, lines 9-15, emphasis added. Fig. 4 shows the conventional belt of Kimura, and the instant specification clearly distinguishes the claimed invention from Kimura. There is no sound basis for believing that the structure of the belt of Kimura is substantially the same as that of the claimed belt, and therefore it is not reasonable to conclude that the cord's proximity to the tooth gap surface would inherently have such irregularities created by the cord twist. Further, the Examiner's statement "irregularities and imperfections will exist in every instance, no matter what the physical structure" has no merit in terms of the claim language because the irregularities are not just irregularities and imperfections but are "created by the twisting of the core cords and configured to contact tops of pulley teeth" as defined in Claim 2.

**2. No Canvas Is not Mere Omission of Canvas**

Further, because Kimura's belt has the canvas as the outermost surface, the canvas always contacts tops of pulley teeth, and the surface between the helical teeth does not contact tops of pulley teeth. In contrast, in Claim 2 as amended, "no canvas is formed on the helical teeth and a surface between the helical teeth, said surface having irregularities created by the twisting of the core cords and configured to contact tops of pulley teeth." In Claim 2, in order to show the irregularities on the surface created by the twisting of the core cords, no canvas is formed, and the belt is made of, for example, a resin material such as urethane resin as a mother material so that when the liquid resin material is introduced into a space between an inner cylinder having a toothed shape and an outer cylinder and is then polymerized and vulcanized, irregularities can be formed on the surface, which is created by the twisting of the core cords. When a rubber material constitutes a belt, a canvas is used in order to reduce surface friction between the belt and a pulley, and in order to place the canvas on the surface, a viscous material such as a rubber material is used. When the viscous material is used, the canvas is pushed against the inner cylinder and placed on the surface of the belt. If a liquid resin material is used, because the liquid resin material passes through a canvas, the canvas is not placed on the surface. Thus, creating irregularities on the surface by the twisting of the core cords and placing a canvas on the surface are not technologically reconcilable.

**3. Kimura Is Silent on And Unrelated to Surface Irregularities Created by Core Cord Twist**

Further, in Kimura, it is critical that *inclination of the core wire 2* and *inclination of the texture 30a of the canvas cloth 3* are set at an opposite direction of the belt tooth trace 10a relative to the belt running direction (e.g., [0018]). Although Kimura mentions S-twist and Z-twist, the selection is made only in combination with the use of a canvas, i.e., the selection of S-twist or Z-twist is *unrelated* to surface irregularities created by the core cord twist. Furthermore, Kimura in no way teaches changing the inclination of the core cord twist (which is different from inclination of the core wire) to resist thrust force. Without using a canvas, resisting thrust force by using irregularities created by the twist of core cords whose twist angle is set as defined in Claim 2 is original and highly creative.

#### **4. Onoe's Belt Has Dissimilar Structures**

The Examiner asserts that modified Kimura fails to explicitly disclose a core cord twist angle set to 15° to 2°, but Onoe et al discloses an equation to determine the twist angle of the reinforcement cords. However, Onoe et al teaches a V-ribbed belt (fan belt) power transmission belt which is a *different type* of belt from a helical synchronous belt and has dissimilar structures to those of a helical synchronous belt. As shown in Fig. 1 of Onoe et al, load carriers 6 composed of twisted cords and ribs 3 are *both aligned in a belt running direction*. In contrast, in a helical synchronous belt, teeth are arranged at a slightly inclined angle relative to a direction perpendicular to a belt running direction. Thrust force is absolutely irrelevant to the belt of Onoe et al. In Onoe et al, the occurrence of oscillation of the belt is unrelated to thrust force. There is *no rational reason* to combine the teachings of Kimura and the teachings of Onoe et al.

#### **5. Figs. 7 and 9 of Onoe Show Twist $\alpha$ , Not $\gamma$ , and are Unrelated to Thrust Force**

Further, the Examiner asserts that Onoe et al discloses a relationship between oscillation of the belt and the angle of final twist (Fig. 7, Fig. 9). However, the Examiner's above understanding is not accurate. As shown in Fig. 2, in Onoe et al, the load carrier 6 is composed of twist yarn 12 which is formed by single yarn 11 (col. 3, lines 1-5). There are two twisting angles: One is a twisting angle of twist yarn 12 which is represented by  $\gamma$ , the other is a twisting angle of single yarn 11 which is represented by  $\alpha$  as shown in Fig. 2. The Examiner confuses the two different twisting angles  $\gamma$  and  $\alpha$ . Fig. 7 and Fig. 9 show the relationship between oscillation of the belt and *the angle of final twist  $\alpha$ , not  $\gamma$* . The relationship between oscillation of the fan belt and the angle of final twist  $\alpha$  of the single yarn 11 is unrelated to and has no rational connection to resistance to thrust force in a helical synchronous belt.

**6. In Onoe, Ribs Contact Pulley      zxsww1d121**

Furthermore, in Onoe et al, because of the ribs 3 which contact the surface of pulley, surface irregularities by the twisting of core cords are irrelevant, and regardless of what Figs. 7 and 9 show, the effect of twist  $\alpha$  of the single yarn 11 is unrelated to surface irregularities created by the cord twist.

**7. There Is No Rational Reason to Combine the References**

As clearly required by KSR and obviousness guidelines provided by the Office, obviousness combinations and modifications must be supported by a rational reason. In view of the above, there is no rational reason to combine the teachings of Kimura and the teachings of Onoe et al. Claim 2 could not be obvious over Kimura, Ueda et al, and Onoe et al. Claims 3, 5, and 7 also could not be obvious at least due to their dependencies from Claim 2 in addition to the other distinguishing features recited therein. Claim 10 as amended herein recites similar features to those discussed in relation to Claim 2, and therefore, for similar reasons, Claim 10 could not be obvious. Claims 11-13 also could not be obvious at least due to their dependencies from Claim 10 in addition to the other distinguishing features recited therein.

Applicants respectfully request withdrawal of the rejections.

**Rejections of Claims 4, 6, 8-9 and 12 Under 35 U.S.C. § 103**

Claims 4, 6, 8-9, and 12 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Kimura (JP 10-184808) in view of Ueda et al ("Noise and Life of Helical Timing Belt Drives") and Onoe et al (US 4,790,802) and further in view of Fujita (US 6,216,853).

As discussed above in relation to Claims 2 and 10, Claims 2 and 10 could not be obvious over Kimura, Ueda et al, and Onoe et al. Fujita does not supply the deficiencies of the above references, and therefore, Claims 2 and 10 could not be obvious over Kimura, Ueda et al, Onoe et al, and Fujita. Claims 4, 6, 8-9, and 12 also could not be obvious at least due to their dependencies from Claim 2 or 10 in addition to the other distinguishing features.

Applicants respectfully request withdrawal of the rejections.

**Rejection of Claim 13 Under 35 U.S.C. § 103**

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Claim 13 has been rejected under 35 U.S.C. § 103(a) as being unpatentable over Kimura (JP 10-184808) in view of Ueda et al ("Noise and Life of Helical Timing Belt Drives") and Onoe et al (US 4,790,802) and further in view of Uehara et al (JP 55-51148).

The features of Claim 13 have been included in Claims 2 and 10, and Claim 13 has been canceled. As discussed above in relation to Claims 2 and 10, the patentability of Claims 2 and 10 does not reside simply in the omission of a canvas, and the features recited in Claims 2 and 10 are not taught or suggested in Uehara et al in any predictable manner. Kimura, Ueda et al, Onoe et al, and Uehara et al, in any combination, could not render Claims 2 and 10 obvious.

### **CONCLUSION**

In light of the Applicant's amendments to the claims and the foregoing Remarks, it is respectfully submitted that the present application is in condition for allowance. The grounds for rejection which are not discussed herein are moot and Applicants expressly do not acquiesce in the findings not separately addressed. Should the Examiner have any remaining concerns which might prevent the prompt allowance of the application, the Examiner is respectfully invited to contact the undersigned at the telephone number appearing below.

### **No Disclaimers or Disavowals**

Although the present communication may include alterations to the application or claims, or characterizations of claim scope or referenced art, the Applicants are not conceding in this application that previously pending claims are not patentable over the cited references. Rather, any alterations or characterizations are being made to facilitate expeditious prosecution of this application. The Applicants reserve the right to pursue at a later date any previously pending or other broader or narrower claims that capture any subject matter supported by the present disclosure, including subject matter found to be specifically disclaimed herein or by any prior prosecution. Accordingly, reviewers of this or any parent, child or related prosecution history shall not reasonably infer that the Applicants have made any disclaimers or disavowals of any subject matter supported by the present application.

**Appl. No.** : 10/595,804  
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Please charge any additional fees, including any fees for additional extension of time, or credit overpayment to Deposit Account No. 11-1410.

Respectfully submitted,

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